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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,393	01/10/2002	John E. Richardson	1437438	4609

22913 7590 09/11/2003

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EXAMINER

KAO, CHIH CHENG G

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/043,393

Applicant(s)

RICHARDSON, JOHN E.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The abstract of the disclosure is objected to because the abstract may not exceed 150 words in length. Correction is required. See MPEP § 608.01(b).

### *Claim Objections*

2. Claim 1 is objected to because of the following informalities: “(ii)” is recited twice in line 14 and 16. This objection may be obviated by replacing “(ii)” in line 16 with - -(iii)- -. Appropriate correction is required.

### *Drawings*

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore the following features:

claims 7, 13, and 21, the heat pipe attached to the cooling block and having an interior portion in fluid communication with the chamber

claim 22, at least one extended surface is joined to at least one heat pipe, and

claim 24, helical fins,

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6, 8, 9, 11, 12, 15, 17, 19, 20, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder et al. (US Patent 6160868) in view of Goodenough (US Patent 4071768), Panasik et al. (US Patent 6445769), and Odohira et al. (JP 53-126887).

5. With regards to claims 1, 9, and 15, Snyder et al. discloses a rotating anode x-ray device (Fig. 1) comprising an electron source and anode (col. 1, lines 14-22), said anode mounted to a shaft (Fig. 1, #12), and a bearing assembly rotatably supporting the shaft (Fig. 1, #18a), a bearing housing (Fig. 1, #16), a heat sink including a cooling block (Fig. 1, #28) and a shell joined to the cooling block and enclosing the area of heat transfer and cooperating therewith to define a coolant chamber (Fig. 1, shell for #36).

However, Snyder et al. does not disclose a vacuum enclosure, a shell enclosing at least one extended surface, a means for transferring heat from the cooling block, and an external cooling unit.

Panasik et al. teaches the vacuum enclosure (Fig. 1, #12) and the external cooling unit (Fig. 1, #102). Goodenough teaches at least one extended surface (Fig. 1, surface around #27)

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and a means for transferring heat from the cooling block (Fig. 1, #21). Odohira et al. teaches a shell enclosing at least one extended surface (Fig. 2, #15).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the vacuum of Panasik et al. with the device of Snyder et al., since one would be motivated to incorporate this to reduce scattering of electrons from the cathode to the anode as implied from Panasik et al. (Fig. 1).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the cooling unit of Panasik et al. with the device of Snyder et al., since one would be motivated to incorporate this as a source of cooling fluid to help cool the device as implied from Panasik et al. (Fig. 1).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the at least one extended surface and means for transferring heat of Goodenough with the device of Snyder et al., since one would be motivated to incorporate this to conduct heat away from the anode, shaft, bearings, and etc. as shown by Goodenough (col. 3, lines 1-6, and Fig. 1).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the shell enclosure of Odohira et al. with the suggested device of Snyder et al. in view of Goodenough, since one would be motivated to incorporate this to cool the apparatus as shown by Odohira et al. (Abstract, and Fig. 2).

6. With regards to claims 2 and 3, Snyder et al. further discloses two insulators disposed about the shell to support it (Fig. 1, insulators around #40 and 41).

7. With regards to claim 4, Snyder et al. further discloses a chamber entrance and exit (Fig. 1, #40 and 41).

8. With regards to claim 5, Snyder et al. further discloses the insulator defining the inlet and outlets of the entrance and exit (Fig. 1, #40 and 41).

9. With regards to claims 6, 12, and 23, Snyder et al. further disclose a post joined to the cooling block (Fig. 1, post around #27).

10. With regards to claim 8, Snyder et al. further discloses the block partially received within the bearing housing (Fig. 1).

11. With regards to claim 11, Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggests a device as recited above.

However, Snyder et al. does not disclose a fluid reservoir in which at least a portion of the x-ray device is disposed in communication with the external cooling unit.

Panasik et al. further discloses a fluid reservoir in which at least a portion of the x-ray device is disposed in communication with the external cooling unit (Fig. 5, #114).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the fluid reservoir with the device of Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al., since one would be motivated to incorporate this

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to reduce scattering of electrons from the cathode to the anode as implied from Panasik et al. (Fig. 1).

12. With regards to claim 17, Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggests a device as recited above.

However, Snyder et al. does not disclose annular fins.

Goodenough teaches annular fins (col. 3, lines 1-5).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have fins with the device of Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al., since one would be motivated to incorporate this to provide a path for conducting heat from the anode as shown by Goodenough (col. 3, lines 1-5).

13. With regards to claim 19, Snyder et al. further discloses the one extended surface integral with the cooling block (Fig. 1, #28).

14. With regards to claim 20, Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggests a device as recited above.

However, Snyder et al. does not disclose the block at least partially received within the shell.

Odohira et al. teaches a block at least partially received within the shell (Fig. 2, #15).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the block received in the shell with the device of Snyder et al. in



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view of Goodenough, Panasik et al., and Odohira et al. one would be motivated to incorporate this for transferring away from the device as shown by Odohira et al. (Fig. 2, #15).

15. Claims 7, 13, 21, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. as applied to claims 1, 9, 15, and 23 above, and further in view of Richardson et al. (US Patent 6519317).

16. With regards to claims 7, 13, 21, and 22, Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggest a device as recited above.

However, Snyder et al. does not disclose a heat pipe attached to a cooling block or at least one extended surface.

Richardson et al. teaches a heat pipe attached to a cooling block or at least one extended surface (col. 11, lines 9-15, and Fig. 3A, #325).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the pipes of Richardson et al. with the device of Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al., since one would be motivated to incorporate this to enhance heat transfer as shown by Richardson et al. (col. 11, lines 1-9). Also note that the exact structural configuration, positioning, and number of heat sinks can be varied depending on the particular heat transfer affects as shown by Richardson et al. (col. 11, lines 44-48).

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17. With regards to claim 24, Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggest a device as recited above.

However, Snyder et al. does not disclose helical fins.

Richardson et al. teaches that the exact structural configuration, positioning, and number of heat sinks can be varied depending on the particular heat transfer affects as shown by Richardson et al. (col. 11, lines 44-48).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have helical fins with the device of Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al., since a mere modification in the change in shape is generally recognized to be within the level of ordinary skill in the art as shown by Richardson et al. (col. 11, lines 44-48). One would be motivated to have this as another design to provide a path for conducting heat from the anode.

18. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. as applied to claim 9 above, and further in view of Artig (US Patent 6134299).

Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggests a device as recited above.

However, Snyder et al. does not seem to specifically disclose dielectric fluid.

Artig teaches dielectric fluid (col. 1, lines 29-36).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have dielectric fluid of Artig with the device of Snyder et al. in view of

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Goodenough, Panasik et al., and Odohira et al., since one would be motivated to use it to improve heat transfer for making the device cooler as shown by Artig (col. 1, lines 29-36).

19. Claims 14, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. as applied to claims 9 and 15 above, and further in view of Miller et al. (US Patent 6041100).

Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al. suggests a device as recited above.

However, Snyder et al. does not seem to specifically disclose a heat sink of copper or copper alloys.

Miller et al. teaches a heat sink of copper or copper alloys (col. 5, lines 7-15).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have copper or copper alloys of Miller et al. with the device of Snyder et al. in view of Goodenough, Panasik et al., and Odohira et al., since one would be motivated to use a material that is thermally conductive in a heat sink and reliable for securing components as shown by Miller et al. (col. 5, lines 7-15). Secondly, it would have been within general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

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***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (703) 605-5298. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk



**EDWARD J. GLICK**  
**SUPERVISORY PATENT EXAMINER**